

20 March 2019

**ANIRUDDHA BELSARE**  
*CURRICULUM VITAE*

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**EDUCATION**

2008-2013 Ph.D., Wildlife Science (Focus: Disease Ecology), University of Missouri, Columbia, Missouri, USA (with Dr. Matthew Gompper).  
*Dissertation title:* Disease ecology of free-ranging dogs in central India: Implications for wildlife conservation.  
1991-1996 B.V.Sc. & A.H. (Bachelor of Veterinary Science & Animal Husbandry), Bombay Veterinary College, India.

Short courses

2018 Winter School on Agent-based Modeling of Social-Ecological Systems, Arizona State University, Tempe, Arizona.  
2016 Individual-based (agent-based) modeling at Humboldt State University, Arcata, California.  
2015 Designing courses for significant learning. Dee Fink and Associates.  
2015 Introduction to Outreach. #SciFund Challenge.  
2015 Preparing Future Faculty, Fall 2015 & Spring 2016. University of Missouri, Columbia.  
2015 Entering Mentoring workshop series, Spring 2015. University of Missouri, Columbia.

**RESEARCH EXPERIENCE**

2019 - Research Associate, Boone & Crockett Quantitative Wildlife Center, Michigan State University, East Lansing, MI. I am developing new, high-level quantitative tools that will help address the challenges of wildlife conservation. Specific focus is on population and epidemiological models to study the role of white-tailed deer harvest on the spread of chronic wasting disease in Michigan.  
2017-2019 Postdoctoral Fellow, Center for Modeling Complex Interactions, University of Idaho, Moscow ID, USA.  
- **Leader, OneHealth Working Group:** Collaborative research with a focus on host-pathogen systems of public health or conservation concern. Currently working on: a) Canine rabies project (with Dr. Craig Miller, CMCI), b) Leptospirosis modeling project (with Dr. Claudia Munoz-Zanzi, University of Minnesota), and

## RESEARCH EXPERIENCE (continued)

- c) Raccoon roundworm management project (with Dr. Matt Gompper, University of Missouri).
  - **Collaborator & Modeler**, *Modeling Access Grant Project*: Bighorn sheep pneumonia modeling project.
  - **Collaborator**, *Modeling Access Grant Project*: Modeling Stem Cell Behavior for Advancing Novel Tendon Therapies
  - **Collaborator**, *Tiger territorial dynamics modeling project* (with Dr. Neil Carter, Boise State University; Sep 2017-May 2018).
- 2014-2017 Postdoctoral Fellow, School of Natural Resources, University of Missouri, Columbia, USA. My work focused on the analysis of wildlife diseases in the state of Missouri. I developed models to understand the spread of chronic wasting disease in white-tailed deer in Missouri, and provide a framework for designing effective surveillance strategy.
- 2008-2013 Ph. D., Department of Fisheries and Wildlife Sciences, University of Missouri, Columbia, USA. My dissertation research combined ecologic, epidemiologic and model-based investigations to study the disease ecology of free-ranging dogs around a protected area in central India. Specifically, I examined the local and global implications of dog diseases and disease control measures for wildlife conservation.
- 2007-2009 Indo-Norwegian project on wildlife-human conflict.  
*Rabies as a driver of Human-Wolf conflict and the role of free ranging domestic dogs as carriers of the disease*. Maharashtra, India
- 2006-2007 University of Missouri, Columbia and Rufford Small Grants.  
*Fox ecology project and survey of disease prevalence in free-ranging domestic dogs and possible spill-over risk for wildlife*.
- 2004-2006 Maharashtra Forest Department and Wildlife Trust of India, New Delhi.  
*Helping the Maharashtra State Forest Department to rescue or treat endangered wild carnivores*.  
[http://www.projectwaghoba.in/docs/athreya\\_rap2004\\_final\\_report.pdf](http://www.projectwaghoba.in/docs/athreya_rap2004_final_report.pdf)
- 2003 Ecollage, Pune and Wildlife Protection Society of India, New Delhi.  
*Study of the man-leopard conflict in the Junnar Forest Division, Pune District, Maharashtra*.  
[http://www.projectwaghoba.in/docs/junnar\\_conflict\\_report\\_athreya\\_et\\_2004\\_condensed.pdf](http://www.projectwaghoba.in/docs/junnar_conflict_report_athreya_et_2004_condensed.pdf)

## VETERINARY PROFESSIONAL EXPERIENCE

- 2015 Expert Veterinarian, King Cobra Telemetry Project, Central Kalimantan, Indonesia. Surgically implanted radio-transmitters in two Sumatran Spitting cobras (*Naja sumatrana*) and one Reticulated Python (*Python reticulatus*) (supported by Copenhagen Zoo, Denmark).
- 2009-2010 Curricular Practical Training: After Hours Clinical Crew, Veterinary Medical Teaching Hospital, University of Missouri, Columbia, Missouri, USA.

## *VETERINARY PROFESSIONAL EXPERIENCE (continued)*

2001-2012	Veterinary Consultant, Maharashtra Forest Department. Provided veterinary support during wildlife emergencies, rescue and treatment of wild animals and birds.
1999-2008	Veterinary Practitioner. Owner of private clinic in Pune, India. Medical and surgical treatment of pets (dogs, cats and birds) and livestock in and around Pune city.
2008	Consultant Veterinary Surgeon, King Cobra Telemetry Project, National Geographic Society and Agumbe Rainforest Research Station. (with Romulus Whitaker and Matt Goode).
2005-2008	Veterinary Consultant, Madras Crocodile Bank Trust, Chennai, India.
2001-2004	Veterinary Officer, Rajiv Gandhi Zoological Park & Wildlife Research Center, Pune. Healthcare and management of zoo animals were two main responsibilities. I implemented controlled breeding program' in prolifically breeding species using MGA implants, and also started using transponder microchips for better management of zoo animals.
1996-2001	Consultant Veterinarian, Wild Animal Orphanage & Pune Snake Park.

## **TEACHING AND MENTORING EXPERIENCE**

### Teaching

#### *University of Missouri*

2016, 2014 (Fall)	Instructor, Wildlife Disease Ecology (FW 4810/7810): I co-taught this undergraduate/graduate-level course with Dr. Matthew Gompper.
2016 (Spring)	Instructor, Animal Population Dynamics and Management (FW 4500/7500).
2012-2014	Instructor, General Biology Laboratory (BIO 1020): Fall 2012, Spring 2013 and Fall 2013, Fall 2014.
2010 (Spring)	Teaching Assistant, Introductory Zoology with Laboratory (FW 1100).

#### *State Forest Departments, India*

2005-2006	Designed and taught short courses in chemical immobilization of wild animals for forest department personnel and veterinarians from seven states in India. The project was funded by Rufford Small Grants.
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#### *Maharashtra Forest Department, India*

2003-2004	Trained five emergency response teams (Maharashtra Forest Department personnel) to better manage human-leopard conflict .
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### Mentoring

#### *University of Minnesota*

2015 - 2016	Meghan Mason (Ph. D. candidate), School of Public Health. Leptospirosis dynamics in rodents, dogs and humans in slum communities.
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#### *University of Missouri*

2015	Lucy Mills, graduate student in Department of Agricultural Economics. Agent-based model of collective entrepreneurship.
2014	Anna Maness, undergraduate student in Fisheries and Wildlife Science. Raccoon roundworm project.

## GRANTS, FELLOWSHIPS AND AWARDS

- 2018 Project Director, Canine rabies genome sequencing project. Sudden Opportunity Grant (CMCI, University of Idaho) (\$18000).
- 2016-2021 Co-Principal Investigator, 'Bringing "OneHealth" to rabies research in India: integrating animal ecology, disease ecology, and human health'. Wellcome Trust/ DBT India Alliance Fellowship (PI Abi Vanak).
- 2013, 2010 Annual Research and Creative Activities Forum, Graduate Professional Council, University of Missouri. 2<sup>nd</sup> place (2013) and 1<sup>st</sup> place (2010) in the Veterinary Medicine/Medicine/Health Sciences category.
- 2012-13 Conservation Biology Fellowship, University of Missouri (\$3000).
- 2008-2013 G. Ellsworth Huggins Scholarship, University of Missouri (\$29500 per year).
- 2006 Rufford Small Grant for Nature Conservation (£ 5000); co-investigator for project titled 'Survey of disease prevalence in free-ranging domestic dogs around the Great Indian Bustard Sanctuary, India (with Abi Tamim Vanak).
- 2005 Rufford Small Grant for Nature Conservation (£ 5000) for project titled 'Standardization of procedures required for dealing with wildlife emergencies by training veterinarians and Forest Department personnel in states with high human-wildlife conflicts in India'.

## PUBLICATIONS

1. Belsare, A.V., Gompper, M.E., Keller, B.J., Sumners, J.A., Hansen, L.P., and Millsbaugh, J.J. An agent-based framework for improving wildlife disease surveillance: A case study of chronic wasting disease in Missouri white-tailed deer. 2018. bioRxiv 478610; doi: <https://doi.org/10.1101/478610>
2. Al-Warid, H.S., Belsare, A.V., Straka, K., Gompper, M.E., and Eggert, L. 2018. Genetic polymorphism of *Baylisascaris procyonis* in host infrapopulations and component populations in the Central USA. *Parasitology International* 67 (4), 392-396.
3. Belsare, A.V., Gompper, M.E., and Millsbaugh, J.J. 2018. "MOOVPOPsurveillance" (Version 1.8.0). CoMSES Computational Model Library. Peer reviewed and certified model code. Retrieved from: <https://www.comses.net/codebases/5576/releases/1.8.0/>
4. Richardson, D.J., Leveille, A., Belsare, A.V., Al-Warid, H.S. and Gompper, M.E. 2017. Geographic distribution records of *Macracanthorhynchus ingens* (Archiacanthocephala: Oligacanthorhynchidae) from the Raccoon, *Procyon lotor* in North America. *The Journal of Arkansas Academy of Science* 17: 203-205.
5. Al-Warid, H.S., Belsare, A.V., Straka, K., and Gompper, M.E. 2017. *Baylisascaris procyonis* roundworm infection patterns in raccoons (*Procyon lotor*) from Missouri and Arkansas, USA. *Helminthologia* 54: 113-118.
6. Belsare, A.V., Gompper, M.E. and Millsbaugh, J.J. 2017. "MOOVPOP" (Version 1.8.0). CoMSES Computational Model Library. Peer reviewed and certified model code. Retrieved from: <https://www.comses.net/codebases/5585/releases/1.8.0/>
7. Belsare, A.V. and Gompper, M.E. 2015. To vaccinate or not to vaccinate: Lessons learned from an experimental mass vaccination of free-ranging dog populations. *Animal Conservation* 18, 219-227. (Highlighted article)

## PUBLICATIONS (continued)

8. Belsare, A.V. and Gompper, M.E. 2015. A model-based approach for investigation and mitigation of disease spillover risks to wildlife: dogs, foxes and canine distemper in central India. *Ecological Modelling* 296, 102-112.
9. Vanak, A.T., Belsare, A.V., Uniyal, M. and Ali, R. 2014. Science in the doghouse. *Current Science* 107 (3): 341-343.
10. Belsare, A.V., Vanak, A.T. and Gompper, M.E. 2014. Epidemiology of viral pathogens of free-ranging dogs and Indian foxes in a human-dominated landscape in central India. *Transboundary and Emerging Diseases* 61, 78-86.
11. Belsare, A.V. and Vanak, A.T. 2013. Use of xylazine hydrochloride-ketamine hydrochloride for immobilization of Indian fox (*Vulpes bengalensis*) in field situations. *Journal of Zoo and Wildlife Medicine* 44 (3), 753-755.
12. Belsare, A.V. and Gompper, M.E. 2013. Assessing demographic and epidemiologic parameters of rural dog populations in India during mass vaccination campaigns. *Preventive Veterinary Medicine* 111 (1-2), 139-146.
13. Belsare, A.V. and Athreya, V.R. 2010. Use of xylazine hydrochloride-ketamine hydrochloride for immobilization of wild leopards (*Panthera pardus fusca*) in emergency situations. *Journal of Zoo and Wildlife Medicine* 41, 331-333.
14. Athreya, V.R. and Belsare, A.V. 2008. Morphometry of leopards from Maharashtra, India. *Cat News* 48.
15. Athreya, V.R., Thakur, S.S., Chaudhuri, S. and Belsare, A.V. 2007. Leopards in human-dominated areas: a spillover from sustained translocations into nearby forests? *Journal of the Bombay Natural History Society* 104, 45-50.
16. Belsare, A.V., Athreya, V.R., Thakur, S.S., and Chaudhuri, S. 2004. Life-long identification microchips in leopards caught in conflict areas in Maharashtra, India. *Cat News* 41, 10-11.
17. Umrigar, K.D. & Belsare, A.V. 2003. Contraception in a blackbuck (*Antelope cervicapra*) using Melengestrol Acetate. *Zoos' Print Journal* 18(6): 1129.

## MANUSCRIPTS IN PREPARATION

1. Mason, M., Belsare, A.V., Gompper, M.E., and Munoz-Zanzi, C. Transmission dynamics of Leptospirosis in impoverished high density communities: An agent-based model incorporating humans, rodents, dogs and the environment.
2. Gompper, M.E. and Belsare, A.V. Intraguild predation benefits the killing species in communities with shared pathogens.

## REPORTS, POPULAR ARTICLES, AND UNPUBLISHED MATERIALS

1. Vanak, A.T. & Belsare, A.V. The street is no place for dogs. *The Hindu*, 3 October 2016.
2. Belsare, A.V. 2013. Diseases of free-ranging dogs: Implications for wildlife conservation in India. *Current Conservation* 7 (4): 3-12.

## REPORTS, POPULAR ARTICLES, AND UNPUBLISHED MATERIALS (continued)

3. Belsare, A.V. 2012. To Dart or Not To Dart- Demystifying Wild Animal Immobilization. Conservation India. (<http://www.conservationindia.org/resources/opinion/to-dart-or-not-to-dart-demystifying-wild-animal-immobilization>)
4. Belsare, A.V. 2011. Rabies: a neglected killer. Current Conservation 5 (2): 19-21.
5. Vanak, A.T., Belsare, A.V. and Gompper, M.E. 2007. Survey of disease prevalence in free-ranging domestic dogs and possible spill-over risk for wildlife. Report submitted to the Rufford Small Grants Foundation, UK. Pp 1-13.
6. Athreya, V.R. and Belsare, A.V. 2007. Human-leopard conflict management guidelines. Kaati Trust, Pune, India. ([www.projectwaghoba.in/docs/human\\_leopard\\_conflict\\_management\\_guidelines\\_english.pdf](http://www.projectwaghoba.in/docs/human_leopard_conflict_management_guidelines_english.pdf))
7. Belsare, A.V. 2007. An Autobiography (of a leopard). Balbharati Standard 6 textbook: Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. Pp 88-94. ([www.balbharati.in/downloadbooks/6th-Balbharati-Eng.pdf](http://www.balbharati.in/downloadbooks/6th-Balbharati-Eng.pdf))
8. Athreya, V.R. and Belsare, A.V. 2005. Helping the Maharashtra Forest Department rescue or treat endangered wild carnivores. Report submitted to the Wildlife Trust of India, New Delhi and the Office of the Chief Wildlife Warden, Maharashtra.
9. Athreya, V.R., Thakur, S.S., Chaudhuri, S., and Belsare, A.V. 2004. A study of man-leopard conflict in the Junnar forest division, Pune district, Maharashtra. Report submitted to the Office of the Chief Wildlife Warden, Maharashtra State Forest Department, and the Wildlife Protection Society of India, New Delhi, India.

## ABSTRACTS AND MEETING PRESENTATIONS

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| 2017 | <i>Size matters: sample size calculations for harvest-based wildlife disease surveillance using an agent-based framework.</i> 24 <sup>th</sup> Annual Conference of The Wildlife Society. September 2017. Albuquerque, New Mexico.                 |
| 2017 | <i>Raccoon roundworm intensity distributions across hosts and modeled implications for population management.</i> 24 <sup>th</sup> Annual Conference of The Wildlife Society. September 2017. Albuquerque, New Mexico. (with Dr. Matthew Gompper). |
| 2017 | <i>Host biodiversity and tick-borne disease: Implications for temperate agroforestry</i> (J.R. Falco, A.V. Belsare, M.E. Gompper, S. Jose). 15 <sup>th</sup> North American Agroforestry Conference. June 2017. Blacksburg, Virginia.              |
| 2017 | <i>A model-based framework for improving chronic wasting disease surveillance in white-tailed deer populations of Missouri.</i> 40 <sup>th</sup> Annual meeting of the Southeast Deer Study Group. February 2017, St. Louis, Missouri.             |
| 2016 | <i>The occurrence of Baylisascaris procyonis in raccoons (Procyon lotor) from Missouri and Arkansas, USA</i> (H.S. Al-Warid, A.V. Belsare, K. Straka and M.E. Gompper). Missouri Life Sciences Week, 2016.   |
| 2014 | <i>ABM for CWD: An adaptive disease management strategy.</i> 38 <sup>th</sup> Annual Midwest Deer & Wild Turkey Study Group Meeting. September 2014. Potosi, Missouri.   |

## ABSTRACTS AND MEETING PRESENTATIONS (continued)

- 2010 *A potential model framework to investigate disease progression.* In: 2010 White-nose Syndrome Symposium: May 2010, Pittsburgh, Pennsylvania. U.S. Fish and Wildlife Service.
- 2007 *Capacity building of wildlife managers in dealing with wildlife emergencies.* Poster presented in the Annual Meeting of the Society for Conservation Biology, Port Elizabeth, South Africa.

## MEMBERSHIPS AND PROFESSIONAL ACTIVITIES

### Memberships

- 2017-current The Wildlife Society
- 2017-current Full member & reviewer, CoMSES Net (Network for Computational Modeling in Social and Ecological Sciences).
- 2016-current Certified EpiCore member. EpiCore is a community of health professionals around the world, providing expertise to verify suspected or rumored disease outbreaks.
- 1996-current Registered with the Maharashtra State Veterinary Council (Constituted under Indian Veterinary Council Act, 1984).

### Associate Editor

- 2016, 2017 Oecologia Australis

### Manuscript reviewer (<https://publons.com/a/340221>)

- 2019 Journal of Applied Ecology, Journal of Wildlife Management
- 2018 African Journal of Ecology, Urban Ecosystems, Polar Research, Animal Conservation, Journal of Parasitology, Journal of Threatened Taxa
- 2017 Polar Research, Heliyon, Ecological Modelling, Scientific Reports, Journal of Wildlife Diseases, Journal of Threatened Taxa, BMC Veterinary Research, Preventive Veterinary Medicine
- 2016 Journal of Threatened Taxa, Vaccine
- 2015 Veterinary Medicine & Science, PLOS One, Animal Conservation, BMC Veterinary Research, Journal of Wildlife Diseases, Urban Ecosystems, Ecological Modelling
- 2014 International Journal of Biodiversity and Conservation, Veterinary World, Journal of Threatened Taxa, Current Science, Mammal Research, Acta Theriologica
- 2013 PLOS One, Journal of the American Veterinary Medical Association, Urban Ecosystems, Current Science, 2012 Journal of Threatened Taxa
- 2010 Journal of the American Veterinary Medical Association, Veterinary Parasitology

Meetings / Workshops attended

- 2017 24<sup>th</sup> Annual Conference of The Wildlife Society. 23 – 27 September 2017. Albuquerque, New Mexico.
- 2017 40<sup>th</sup> Annual meeting of the Southeast Deer Study Group. 27 February – 1 March 2017. St. Louis, Missouri.
- 2014 38<sup>th</sup> Annual Midwest Deer & Wild Turkey Study Group Meeting. 9 – 12 September 2014. Potosi, Missouri.
- 2014 Ecology and Evolution of Infectious Disease, 2 – 4 June 2014. 12<sup>th</sup> Annual Conference at Colorado State University, Fort Collins, Colorado.
- 2010 White-nose Syndrome Symposium: 25 – 27 May 2010, Pittsburgh, Pennsylvania.
- 2007 Annual Meeting of the Society for Conservation Biology, Port Elizabeth, South Africa.